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## Curative surgery for locally advanced retroperitoneal mature teratoma in an adult. Case report

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## ABSTRACT

**INTRODUCTION:** Primary teratomas of retroperitoneum are not usual in the adult population. These tumors most commonly seen at the gonadal and sacrococcygeal regions. Herein we describe a case of an 18-year-old female who had a benign cystic teratoma at the retroperitoneum.

**PRESENTATION OF CASE:** The patient underwent an operation at another hospital following a misdiagnosis of hydatid cyst. The patient was referred to our hospital because of the detection of an unresectable tumor during her operation. A computerized tomography (CT)-angiography revealed a cystic mass, with a diameter of 14 cm which was invaded into the retrohepatic suprarenal inferior vena cava and also extended to the posterior aspect of the liver. Additionally the mass invaded the posterior wall of the inferior vena cava and the right renal vein. The tumor was completely resected with a vascular resection. The inferior vena cava was reconstructed with a 12 cm Dacron® graft and the renal vein was implanted. The patient's postoperative period was uneventful.

**DISCUSSION:** Germ cell tumors of retroperitoneum are usually seen in children, but there are also some reports of adult cases in the literature. Adult cases are especially seen in females. Imaging studies are paramount for diagnosis, preoperative strategy and safe surgical excision. CT scans and MRIs can identify various components of these tumors.

**CONCLUSION:** Even though primary retroperitoneal teratomas are quite rare in adults. Preoperative radiology imaging and strategy is critical for performing a safe surgery. The gold standard treatment strategy for this neoplasm is the surgical resection.

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## 1. Introduction

Teratomas are non-seminomatous type germ cell tumors, containing all three germ layers. They are most commonly seen among newborns and children.<sup>1,2</sup> They usually arise in the gonads, but there has been several case reports about teratomas in extragonadal locations, such as the mediastinum, neck, and retroperitoneum.<sup>3</sup> Even though their incidence is characterized by a bimodal curve, teratomas are usually seen in women who are in their reproductive period.<sup>4</sup> In most cases they are presented as asymptomatic, or the patients' complaints are nonspecific.<sup>3,5</sup>

## 2. Case report

An 18-year-old woman who was admitted to another hospital with a six-month history of nonspecific abdominal pain, underwent surgery following a misdiagnosis of a hydatid cyst from the right lobe of the liver. A solitary, cystic and hairy tumor was established

during the surgery. The cyst was opened, and bristles and fluid were evacuated. The tumor had been found irresectable because of the major vascular invasion to the inferior vena cava. Afterwards, the patient was referred to our hospital. The patient's medical history was clear and all biochemical tests and tumor marker levels (include alpha-fetoprotein: 1.66 (0–5) ng/mL) were within the normal range.

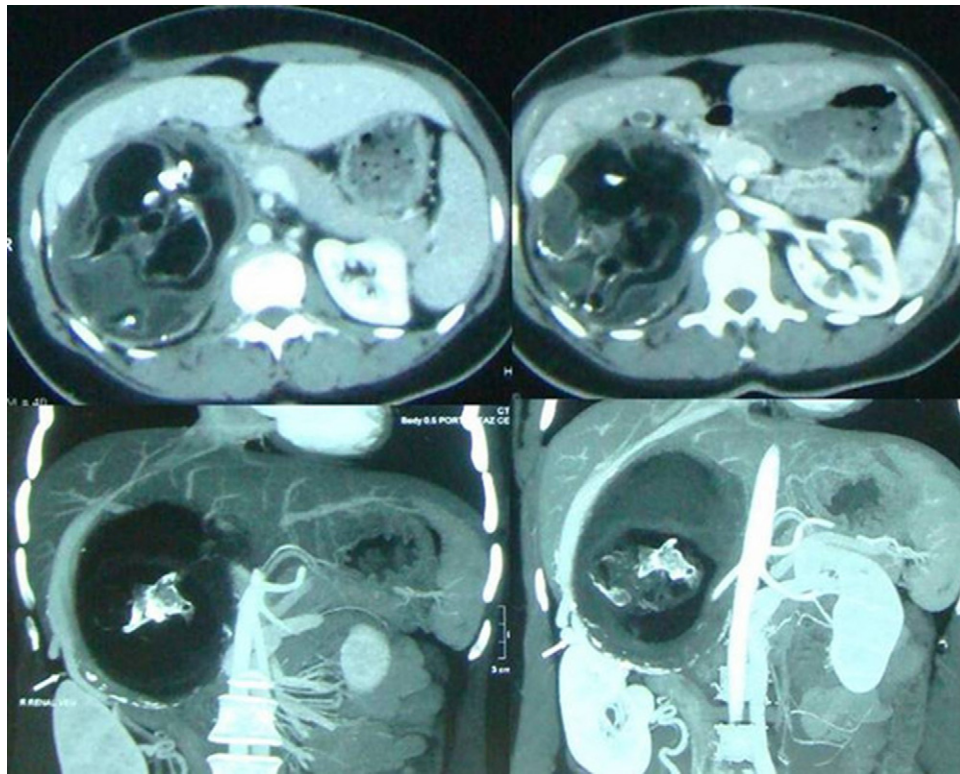
The CT-angiography and MRI studies showed a 14 cm solitary cystic mass in diameter which was closely related to the retrohepatic suprarenal inferior vena cava. Extension toward the right kidney and adrenal areas was seen, but there was no evidence of invasion (Fig. 1). No distant organ metastasis was detected.

Posterior wall invasion of the inferior vena cava was seen during the surgery, and the right renal vein was also invaded by the tumor. During procedure, the tumor was completely removed along with the invaded vasculature. A 12 cm segment of the inferior vena cava and the proximal sites of the inferior and superior right renal veins were resected. The inferior vena cava was reconstructed with a 12 cm Dacron® graft and both renal veins were implanted in the native inferior vena cava (Fig. 2).

Upon a pathological examination, high viscosity materials, including gray hairs were found. Microscopically, it was presented as a cystic tumor which contains squamous epithelia, skin adnexa,

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**Fig. 1.** The imaging studies showing a 14 cm solitary cystic mass.

bone marrow, ciliated columnar epithelia, fat, bone and nerve tissues. It was compatible with patterns of a mature teratoma (Fig. 3).

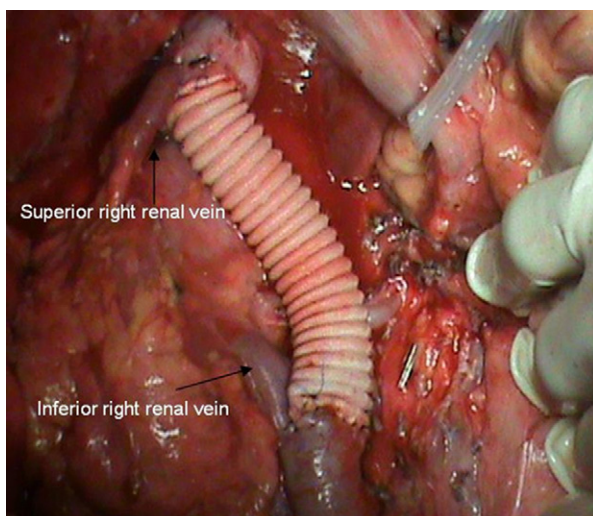
The postoperative period was uneventful, with the patient on anticoagulant treatment (low molecular weight heparin and warfarin). The patient was discharged on postoperative day 6 and experienced no problems during the following year.

### 3. Discussion

Germ cell tumors of retroperitoneum are usually seen in children, but there are also some reports of adult cases in the literature.<sup>4</sup> Adult cases are especially seen in females.<sup>6</sup> Teratomas

are the most common type of germ cell tumors, and most of these neoplasms are benign.<sup>5,6</sup> The distribution of teratomas includes (in order of decreasing frequency): ovaries, testes, anterior mediastinum, retroperitoneum, presacral and coccygeal areas, pineal and other intracranial sites, and neck.<sup>7,8</sup> Teratomas are seen in extragonadal areas in 1–5% of cases, and retroperitoneal teratomas comprise less than 10% of all primary retroperitoneal tumors.<sup>7</sup> Predominance of left sided retroperitoneal teratomas has been noted previously,<sup>9</sup> but in our case, the teratoma was located on the right side, close to the liver, kidney and major vasculature.

Imaging studies are paramount for diagnosis, preoperative strategy and safe surgical excision. CT scans and MRIs can identify various components of these tumors. CT or MRI angiography can detect the vascularization of the tumor, the proximity to the



**Fig. 2.** The image showing the reconstruction of inferior vena cava with a 12 cm Dacron® graft.



**Fig. 3.** The excised mass after resection.

major vascular structures and adjacent organs, and also distant metastasis.<sup>7</sup> In our case, we saw the proximity to the renal veins and inferior vena cava, but there was no evidence of vascular invasion. Teratomas often expand and press to the surrounding structures rather than invading.<sup>10,11</sup> This allows a greater chance of successful removal, even in the case of a large tumor. In this case, the tumor was found to be invaded the inferior vena cava rather than pressing it and because of the circumferential invasion, we needed to resect the inferior vena cava instead of shaving the tumor from wall of vena cava.

Teratomas are classified on the basis of their histopathological findings, and divided in three categories: mature (cystic/solid, benign), immature (malignant), and monodermal (highly specialized).<sup>11</sup> The predicted 5-year survival rate following a curative resection is 100% in benign tumors.<sup>12</sup> Teratomas with a malignant transformation are reported rarely, and non-germ cell malignant tumors can arise from a pre-existing mature teratoma.<sup>2,13</sup> A teratoma that invades adjacent structures requires more extensive resection, and may involve vascular reconstruction.<sup>14,15</sup> Unresectable or marginally resectable malignant retroperitoneal teratomas may be downstaged after an initial course of chemotherapy.<sup>15,16</sup>

In our case, the tumor capsule was opened during the first operation and as far we know this is a risk factor for local or systemic relapse in this kind of pathology. Surgery plays an important role when the tumor is located at a single site as in our case. It has been reported in the literature that the complete surgical resection is the most important prognostic factor, and the postoperative prognosis is good if the tumor has not extended beyond the capsule or the capsule is not penetrated during operation.<sup>17</sup>

In literature there are few case reports<sup>18,19</sup> regarding to giant teratomas and these reports mentioned about the possibility of major vascular invasions but did not report a case with major vascular reconstruction. We believe that our case is an original report due to the major vascular reconstruction. The case also supports the previous case reports in the literature by showing the major vascular invasion and also its reconstruction.

#### 4. Conclusion

Even though primary retroperitoneal teratomas are quite rare in adults, a clinician should be alerted by the presence of a large retroperitoneal mass containing adipose tissue, soft-tissue structures, bone, calcium constituents and sebaceous fluids, et cetera, without ascites, lymph node involvement or liver or splenic metastasis. Diagnosis can be made on the basis of imaging studies. Preoperative radiology imaging and strategy is critical for performing a safe surgery. The gold standard treatment strategy for this neoplasm is the surgical resection.

#### Conflict of interest statement

None.

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#### Consent

Obtained.

#### Authors' contributions

All authors contributed.

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